CARNEGIE INSTITUTION OF WASHINGTON
DEPARTMENT OF GENETICS
COLD SPRING HARBOR, LONG ISLAND, N. Y.

July 17, 1946

Dear Lederberg:

I got your letter and the K-12 stock, which is now being tested. As for lyophilizing phage, it is possible to do it from broth. I am, however, convinced that the best way of preserving phage is to keep liquid suspensions in screw-cap bottles or sealed vials in the refrigerator. Not only does it keep the activity, but also the titer. This is true for all our phages except T3, which is slowly inactivated.

As for the recombination problem, I agree that the nutritional recombinations should be used for selection. I have some comments on your suggestion for studying the separation of characters from complex mutations - Method 1.

$$A - \times B -/n,\ m \longrightarrow A^+B^+/n,\ A^+B^+/m$$

This method should work provided either we do not use the mutation B/1, which involves tryptophane requirement, or we find the conditions needed for growth of B/1 in tryptophane agar (probably 500 gamma of tryptophane/ml.). One possible application would be to try splitting the common resistance groups.

Method 2. If all recombinations may occur at random, I doubt that one can rely on <u>failure</u> to isolate a certain type. As a check, I think one should try to test for all possible classes of recombinations from

$$A-/n \times B-/m$$

There should be four classes of prototrophes as regards resistance, but I doubt they can all be found. An additional method is to mix A-/n, m x B-/n, p and obtain A^+B^+/n.

The only real use of selecting for phage resistance seems to be in the detection of reciprocal classes.

$$A^+B-/n/m \times A-B^+/p/q$$

could give A^+B^+ susceptible; one should find in the same culture an $A-B-/n/m/p/q$ (unless lethal) detectable by phage resistance. There are serious difficulties involved in such test, since we do not have four completely independent, bona fide single resistant mutants.

When do you think you may have the multiple biochemical mutants? If it were not for the advantage of using B/r, I would suggest to make some biochemical mutants from my complex resistant strains, thus saving the serious trouble of hunting for very rare complex mutants again. If you want, I can send you four good complex mutants for this purpose.

Best regards,

Luria

Have you told Miss Gesser to call me up? If not, please do.